INNOVATING IN UNIVERSITY: A REAL ALTERNATIVE OR ALWAYS THE SAME THING?

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ABSTRACT

Research in the educational field on implicit theories suggests that the nature of innovations in university teaching contexts depends, to a large extent, on what theories teachers have constructed about what it means to learn, teach and innovate. Our main objective was to analyze the implicit theories of a group of twelve professors who presented innovation projects in a Chilean university. Following a qualitative approach, in-depth interviews were conducted with each of these teachers, who were responsible for the projects. Our results suggest that teachers conceive learning, teaching and innovation from a series of constructivist notions. However, at the moment of foreseeing the instructional design of their projects they fail on identifying the manner in which these aspects should be concretized in practice. We discuss implications of these results for both research and educational practices.

Keywords: Higher education; implicit theories; educational psychology.

Innovar en la universidad: ¿una alternativa real o más de lo mismo?

RESUMEN

La investigación en el campo educativo sobre teorías implícitas sugiere que la naturaleza de las innovaciones en docencia universitaria depende, en buena medida, de cuáles son las teorías que los profesores tienen sobre qué significa aprender, enseñar e innovar. El objetivo de esta investigación fue analizar las teorías implícitas de un grupo de doce profesores que presentaron proyectos de innovación en docencia universitaria en una universidad chilena. Siguiendo un enfoque cualitativo, se realizaron entrevistas en profundidad a cada uno de los docentes responsables de los proyectos. Los resultados sugieren que los profesores conciben el aprendizaje, la enseñanza y la innovación a partir de una serie de nociones constructivistas, pero al momento de prever el diseño instruccional de sus proyectos no logran identificar la forma en que estos aspectos se concretizan en la práctica. Se discuten las implicancias de estos resultados para la investigación y para mejorar las innovaciones educativas universitarias.

Palabras clave: enseñanza universitaria; teorías implícitas; psicologiza educacional.

Inovar na universidade: uma alternativa real ou mais do mesmo?

RESUMO

A investigação no campo educativo sobre teorias implícitas sugere que a natureza das inovações na docência universitária depende, em boa medida, de quais são as teorias dos professores sobre o que significa aprender, ensinar e inovar. O objetivo desta investigação foi analisar as teorias implícitas de um grupo de doze professores que apresentaram projetos de inovação em docência universitária em uma universidade chilena. A partir de um enfoque qualitativo, realizaram-se entrevistas em profundidade com os docentes responsáveis pelos projetos. Os resultados sugerem que os professores concebem a aprendizagem, o ensino e a inovação a partir de uma série de noções construtivistas, mas no momento de prever o desenho instrucional de seus projetos não conseguem identificar a forma em que estes aspectos se materializam na prática. Discutem-se as implicações destes resultados para a pesquisa e para melhorar as inovações educativas universitárias.

Palavras-chave: ensino superior; teorias implícitas; psicologia educacional.

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INTRODUCTION

Currently, there are more and more higher education institutions that implement teaching innovation projects. The underlying idea is that these innovations could contribute to improving the learning opportunities of students entering higher education (Barron, 2006; Postareff, Lindblom-Ylänne, & Nevgi, 2007). However, the path between an innovation project and the improvement of educational practices can be quite long and complex (Salinas, 2004).

Particularly in Chile, it is necessary to design, implement and evaluate innovations at the university level. This has been known for several years thanks to, for example, international studies such as the one conducted by the Organization for Economic Cooperation and Development [OECD] (2009). According to this institution, it is necessary to rethink the way in which teachers are starting the teaching and learning processes in higher education since it is possible to observe a series of weaknesses: (a) the emphasis on learning as an individual process; (b) learning centered on memory processes; and (c) evaluations aimed at the reproduction of knowledge. These results clearly suggest that it seems necessary to implement changes in educational practices aimed at putting into practice a constructivist conception of learning (Coll & Engel, 2018) that considers educational activities as collaborative processes, focused on understanding and that understand the assessment as a learning tool for students.

This has motivated the design of public policies - especially focused on financing - that seek to overcome these difficulties. A concrete example of this type of policy can be found in the Programa de Mejoramiento de la Calidad y Equidad de la Educación Superior [MECESUP][1], which currently depends on the Ministry of Education of Chile. In general terms, the objective of this program is to strengthen the capacities and quality of the country higher education institutions. However, those responsible for these initiatives have pointed out that among the limitations of these aid mechanisms are the difficulties in monitoring and evaluating the projects developed by the universities, and the impact that these projects have on students' learning (MINEDUC, 2010).

In this context, it seems essential to carry out research that contributes. In order to identify the conceptions around teaching and learning that a group of university professors who carry out changes in their practice have, twelve innovation projects were selected. Likewise, the framework of implicit theories about teaching and learning was used as the theoretical space

through which to study the innovation of educational practices (Alves & Pozo, 2014; Pozo, 2017). The implicit theories have been defined as a "set of coherent and consistent principles that restrict the way of facing, interpreting and attending to the different situations we face" (Pérez Echeverría, Mateos, Scheuer, & Martín, 2006, p. 79). These theories originate from personal experience, informal education and implicit learning, and correspond to conceptions of a procedural and pragmatic nature, which depend on the context and they are activated automatically (Alves & Pozo, 2014; Pozo, 2017).

In general terms, the framework of implicit theories allows us to respond to the way in which teachers conceive an educational activity when designing a didactic sequence or instructional process, the framework in which the educational activity operates. However, it should be noted that educational activity can be considered in itself a practical situation that, ultimately, cannot be resolved only from the implicit theories, images or conceptions according to the theory adopted (Clarà, 2013; Clarà & Mauri, 2010; Korthagen, 2010). Considering the complexity of educational action, the use of implicit theories provides a framework that allows observing the representations that teachers have regarding what learning is and eventually the coherence between said representation and their action. In summary, the question that guides this research is what leads a teacher to make a decision regarding the way they design an educational situation considered as innovative?

In the broad framework of this discussion, Pozo et al. (2006) propose three theories that would organize and mediate the relationship with learning: direct theory, interpretive theory, and constructive theory. Each of these theories gives us a general framework about the conceptions of what teaching and learning are, and what would lead us to regulate our teaching activity, in this case being the design of an innovation project.

The direct theory considers learning as a transmission process, without the existence of mediation as an intermediate mechanism, between teaching and learning, thus focusing on learning outcomes. Interpretive theory, while incorporating the notion of mediation, defines the learning process as the result of a personal activity, linearly connecting the learning conditions, processes and outcomes. Finally, constructive theory considers learning as a process mediated both socially, through instruments and knowledge, and culturally, mediated by self-regulation processes of the learning activity itself. These three constructs provide a broad framework that allows us to understand the way in which teachers organize their activity or, in other words, account for the conditions, processes and learning outcomes that they propose in

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[1] Program for the Improvement of the Quality and Equity of Higher Education.

this case, based on innovation projects.

From a constructive learning perspective, from where this proposal of analysis of innovations is situated, it is interesting to rescue how these eventual changes in educational activity are materialized in an instructional design. This design requires a way of operating in practice (Coll, Mauri, & Onrubia, 2008) or at least, provides a framework for action provided by the teacher. In other words, the instructional design corresponds to an activity framework that contains conceptions about teaching and learning, typical of the teacher and where the organization or planning of the different activities reflects this conception. These instructional designs give direction to the teaching and learning processes, and contribute to generating a framework of activity with certain participation rules, typical of educational activity.

An example regarding the incorporation of innovations is the wide use that has been given to technological tools (ICT) in teaching and learning processes. Usually, it is assumed that the use of certain technologies can contribute considerably to facilitate processes related to learning (Otero & Antelo, 2018). However, we know very little about the conceptions that are at the base of the use of technological tools. In other words, if the conceptions about what it is to learn correspond to one or another learning theory. It should be noted that the use of any technological tool does not modify educational practices by itself, but rather requires a certain conception of learning that enables the integration of these tools into instructional processes (Roschelle, Dimitriadis, & Hoppe, 2013).

In summary, the incorporation of an innovation requires a learning conception as a constructive phenomenon distributed by different mediating artifacts of the activity, which favors a practice of construction of shared meanings between students and the teacher (Mercer, 2010). However, it should be noted that the implicit theories of the teachers are not necessarily related to the restructuring of educational practice and that, to achieve such coherence, the analysis of other aspects of educational activity is required (Clarà, 2013). In this scenario, our research uses innovation projects as entrance doors to teaching conceptions, since these projects are the way in which teachers signify the conditions, processes and learning outcomes.

METHOD

This research was developed with a qualitative approach in order to know or identify the conceptions of university teachers around the notion of teaching and learning, based on the analysis of their instructional proposals within the framework of twelve teaching innovation projects. The underlying character of implicit theories suggests that, methodologically, they should be approached through indirect methods and / or through different ways of collecting information that allow inferring the implicit elements of the conceptions. It is for this reason that the methodological approach considers in-depth interviews as the main analysis tool that allows contrasting the conceptions indicated by teachers when preparing or designing an innovation.

Participants and context

Twelve university professors from a Chilean university participated in this study. The teachers are from different areas of knowledge (See table 1). The selection criteria for the study participants were two: 1) that their projects focused on a change in the way of teaching a certain content inside the classroom; 2) that their innovation projects consider the evaluation of learning outcomes throughout the project execution. Of the total number of participants, most of the teachers had taken diploma courses in teaching or specific courses such as, for example, teaching evaluation or didactics in higher education.

Data production and analysis

In this research, twelve in-depth interviews were conducted based on two thematic areas: a) innovative characteristics of the proposal; and b) specific stages of instructional design. In the first case, the focus of the questions was to address why the teacher considers the proposal as innovative and in the second, it was the innovation structure or organization. The interviews were audio recorded for later transcription. The analysis of the information produced was carried out from the thematic content analysis, which allows the identification, analysis and generation of patterns (themes) within the data to describe and interpret information about various aspects of the research topic (Boyatzis, 1998; Braun & Clarke, 2006). Based on this procedure, an open coding was carried out that allowed the identification of a series of categories that aimed to assess the meanings that teachers gave to the notion of innovation in teaching and learning.

RESULTS

The results are organized according to three dimensions of analysis that emerge as the main aspects that teachers indicate as relevant when designing and implementing an educational innovation. The first corresponds to the different problems that give rise to the projects, the second to the objectives or purposes that guide the formulation of the project and the third dimension corresponds to the contribution to the change that innovation promotes. In the case of the first dimension, all the analyzed projects arise as responses to two problems that teachers identify as relevant: decontextualized learning and high failure

Table 1. *Participants and teaching innovation projects.*

Teachers	Subject where will develop innovation	Project's name	University teaching training
P1	Industrial Design Workshop	Creation of a virtual laboratory for Chilean industry as a support for labor induction.	Yes
P2	Mathematics	Use of 3D cube to visualize three-dimensional objects for teaching functions.	Yes
P3	Microbiology	Use of participatory techniques in the subject of microbiology.	Yes
P4	Industrial Design Workshop II	Implementation of visual support material for the design workshop subject	Yes
P5	Metallurgical Process Balance	Use of Excel as a learning tool for mass and energy balances in metallurgical processes.	No
P6	Obstetrics	Implementation of clinical simulation laboratory.	No
P7	Food Engineering	Redesign of the food engineering course II.	Yes
P8	Bachelor of Science	Methodologies for the leveling of competences in critical thinking, academic writing and practice of the English language	Yes
P9	English	B-learning module for teaching English to engineering students.	Yes
P10	Accounting	Introducción de un observatorio de gestión contable.	Yes
P11	Agricultural Marketing	Simulated markets as a project-based learning method (PBL) in agribusiness engineering training	Yes
P12	History	Implementation of the didactic knowledge module in the History, Geography and Social Sciences teachers' training.	Yes

rates of subjects.

The first problem that teachers identify refers to the fact that the contents treated in classes are not linked to practical reality, but are kept in an abstract environment, which considerably hinders the attribution of meaning necessary to learn. Thus, the problem derived from the decontextualization of learning is considered a fundamental aspect within the teaching process, since its solution would allow students to better internalize the knowledge addressed in class. The example presented below refers to how a teacher refers to the relationship between content and the development of those content through an activity contextualized in a subject.

> *We only have certain bases for the students to understand where the products come from, therefore, some production they know, but it is not their strong suit. And that has played a bit against us in the processes, so the project is linked to that, in terms of trying to take the boys to the places of production, so that they know where the products come from.* (P11, Professor of Agricultural Marketing).

The second problem recognized by teachers refers to the high failure rate of their subjects, a measure commonly used to represent the learning achieved by students. However, student performance or learning achievement can be identified in a number of ways, including, but not limited to grades. However, the idea of evaluating learning based on grades seems to be unanimous. The following example shows the teacher's reflection around the results of the students and their interpellation regarding their practice.

> [The proposal] *arises from the academic problem that we have. Our branch is a branch considered difficult by students, where we have high failure rates. Then, a reflection arises: "Are we doing things well?"* (P1, Professor of Industrial Design Workshop)

The second dimension is related to the objectives or purposes of innovation projects, of which two main objectives have been identified. The first refers to the importance of facilitating the student's involvement in their own learning process in order to contribute to the development of their skills and their long-term professional training. In the following example, a teacher proposes how to facilitate, through reflective practice, a significant change in pedagogy students.

> *The project is designed to achieve a significant change in the training of students ... What we hope is to train students in reflective practice, and that this becomes part of their teaching identity, so that they continue to develop it later.* (P12, History teacher)

The second objective of the second dimension is related to the improvement of one's own teaching practice. In this sense, teachers identify the development of an innovation project as a contribution to their professional development, since these innovations allow introducing a series of improvements to their practices, such as the incorporation of constant evaluation by students. In this sense, teachers raise the importance of having information that allows them to adjust innovation.

> How are we going to evaluate this? A first approximation is the evaluations that we are doing, if there is a change or there is not a change. Then, the evaluation that we will do when the course ends. In addition, the students are going to do a survey that is to evaluate which are the activities that most influenced learning, which ones were not, which were only fun but the students failed to learn. (P3, Professor of Microbiology)

The third dimension identified corresponds to the contribution to change that innovation promotes. Teachers relate innovation to changing traditional teaching models. It is mainly linked to the use of new methodologies and strategies. The idea behind this notion of change is associated with a diagnosis and a shared concern that the traditional way of teaching does not facilitate effective learning outcomes. Thus, the idea of innovation is raised in terms of progress and improvement of the teaching practice itself.

> Innovating is making changes from traditional perspectives towards others that mean progress and improvement with respect to how things are being done. It is linked to a permanent exercise of contextualizing and diagnosing how things are working to, from there, modify them. (P12, History teacher)

Here appears the need to give a new meaning the teaching practice. In this sense, teachers express that it is necessary to think about how to generate a change in the students' training, from the use of different tools and resources that are available, which must be consistent with the needs of each course.

> [Innovate] is to implement novel things that are in line with the advances in technology and that they are in service of the student being able to acquire better concepts, in favor of teaching. It is not about making a circus, but it is about implementing technologies and methodologies that are in line with the new times ... Updating

them, finding new tools and perfecting others. (P6, Professor of Obstetrics)

In summary, the results presented in this section suggest that teachers show a series of constructive aspects of learning, such as, for example; a) the contextualization of knowledge; b) the importance of the attribution of necessary meaning to learn; c) self-regulation or involvement in learning and; d) reflection of practice. However, they point to grades as the main measure to represent learning. On the other hand, it is not possible to clearly identify the way in which innovation operates in a teaching process. In other words, how innovation takes place, for example; how the reflective process is taught or how the different activities are organized along the didactic sequence where the innovation operates.

DISCUSSION

The implicit theories provide us with a framework of analysis that allows us to understand the way in which teachers conceive and interpret an educational practice. These theories allow making predictions, planning or regulating actions in different domains of practice (when selecting content, managing tasks, evaluating, among others). In other words, they provide a framework for teaching action, which responds to a complex repertoire, both of theoretical and practical knowledge, skills and / or competencies of a professional activity.

In this context, the first dimension of analysis that teachers indicate as relevant is related to the different problems that give rise to the projects. When teachers design an innovation project, they mainly try to link the contents with a certain practical reality and improve the high failure rates of the subjects. In the first case, the decontextualization of learning is perceived as a relevant factor in the teaching and learning process. In the second case, grades are the most commonly used measure to represent teacher learning.

Both aspects (decontextualization of teaching and high failure rates) can be related to different theories that teachers would use to represent the teaching and learning processes. In the first case, teachers refer to the need for the necessary attribution of meaning that students must achieve in order to learn, a relevant aspect from a constructive learning perspective. In the second case, teachers rather refer to a direct theory of learning, since they consider grades as the main measure of learning. However, as noted above, performance or achievement of learning can be identified in several ways, including but not limited to grades.

The second dimension of analysis refers to the objectives or purposes that give rise to the projects. On the one hand, the need for students to get involved in their learning is pointed out and on the other, the

need to facilitate the change of practice. In our opinion, both aspects facilitate involvement in the activity, a central question for learning, which refer to a clearly constructive aspect of learning. However, in no case do teachers refer to the way the activity operates for these purposes. In other words, teachers share the idea that to become involved in learning, they must implement changes in their educational action, but they are unable to specify how they can facilitate such involvement.

The third dimension corresponds to the contribution to change that innovation promotes. As in the previous dimension, teachers coincide in pointing out change as a priority aspect of educational practice based on the use of new methodologies and strategies. However, it is a constant that teachers fail to represent clearly and precisely how innovation operates in educational practice, or how it is organized throughout an instructional process. In other words, the importance of how the educational process is organized around the implementation of innovation does not seem to be a relevant aspect when conceiving educational innovation (Valdés, López, & Jiménez, 2019). In this context, it seems urgent to deepen the instructional design where innovation operates, or in other words, how the activity structure is organized in order to facilitate an innovative practice. In summary, the foregoing makes it difficult to assess innovation -in terms of its contribution to the learning process that it seeks.

It seems relevant to state that innovations can contribute to modifying the conceptions that teachers have about some aspects of the teaching and learning process, to the extent that the introduction of new forms of action, such as the collaboration strategies that innovation implies, the use of various artifacts or instruments that distribute knowledge and the distribution of time, favor new educational practices. However, it is necessary to facilitate these processes from the explicitness of the structure of the activity and its organization, typical of the implementation of any change that is intended.

In this context, there is a need to be able to expand and contrast the results obtained through research that allows a closer approach to the activity itself in order to observe how these innovation processes are configured. Finally, it is equally interesting that despite the fact that teachers have received training around a series of pedagogical aspects, they have not been able to specify the ways of operating their innovation projects (Jiménez, Fardella, & Muñoz-Proto, 2017). Despite these limitations, the results obtained are, in our opinion, of important interest for university teaching training processes. In effect, the conceptions provide a useful and interesting reference for the review of the teacher improvement processes, however, the practical knowledge that can be generated from the implementation of the innovations is of special interest to facilitate a process of change in educational practices.

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